

## **Mapping and Characterization of Recurring Spring Leads in the Beaufort and Chukchi Seas, Alaska**

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The aim of this project is to map and document changes in the spatial and temporal distribution of recurring lead systems and landfast ice extent off the coast of northern Alaska. We analyzed remote sensing imagery, specifically Advanced Very High Resolution Radiometer (AVHRR) data for the time period between 1993 and 2004. These datasets were compared to 1970/80s AVHRR imagery archived at the Geophysical Institute's GeoData Center. Details can be found at the project web site at [mms.gina.alaska.edu](http://mms.gina.alaska.edu).

After inspecting all available AVHRR imagery, channel 1 (visible) and channel 4 (thermal IR) scenes with comparatively low cloud cover (c. 30-40 from December through June) were geolocated and reprojected. An automated algorithm was employed to correct for regional variations in surface temperature or reflectance (incl. thin clouds/fog) and distinguish between open water/leads and ice. The resulting binary image was analyzed for the fraction of open water and the location, size and morphology of leads. Products from this analysis include processed imagery, lead grid and shape files in ArcGIS format and lead statistics. A distinct seasonal cycle in the fraction of open water and the number and morphology of leads is evident in the data. Winter months with low lead fractions contrast with increasing openings in the ice in May and June, as the lead morphology changes from linear leads to interconnected ponds between individual floes. We have identified a small number of characteristic lead patterns and associated processes and are examining whether their relative importance has changed in concert with large-scale changes in ice conditions and atmospheric circulation.